LABORATORY NOTES.

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BERYL.

In determining the alkalies in a beryl from Fahlun, Sweden, the percentage of potash seemed worth noting. In the analyses of beryl accessible to me I find potash put down as one of the constituent alkalies but undetermined. (J. S. Diller Hillebrands Min. Notes, Bull. 55 U. S. Geol. Survey in the case of a white beryl from Winslow, Me.) F. C. Robinson (*J. Anal. Appl. Chem.*, **6**, 510) in a beryl from near Yarmouth, Mass., also notes the presence of phosphoric acid. Beryl from the localities noted in *Dana's Mineralogy*, sixth edition, do not give this alkali. In making the examination the platinic chlorides of cesium (when present) and potassium were boiled with small portions of water until the cesium lines appeared sharply in the spectroscope. The potassium salt was subsequently examined for cesium, with negative results. Other specimens of beryl were then examined and all were found to contain notable quantities of potash. The only contamination appeared to be a little ferric oxide. Nos. I, II, and III, were given to me by the late Dr. F. A. Genth to whose kindness I owe not only the specimens but the constant advice and supervision he gave so freely to those studying under him. No. IV was obtained from Geo. L. English and Co., of New York.

Analyses gave:

I. Fahlun, Sweden, dull yellow. In small grains. Sp. gr. 2.713.

II. Black Mt., Buncombe Co., N. C., apple green. Vitreous. Manganese trace. Sp. gr. 2.748.

III. Acworth, N, H., light green. Vitreous. Sp. gr. 2.714.

IV. Acworth, N. H., light green. Vitreous. Sp. gr. 2.730.

	I.	II.	III.	IV.
SiO_2	64.02	66.24	65.23	66.53
Al_2O_3	16.44	17.64	17.72	17.11
Fe_2O_3	0.68	1.36	1.35	0.94
BeO	12.91	11.06	12.37	12.24

	I.	II.	III.	IV.
MgO	0.23	0.09	0.37	0.20
CaO	0.50	0.36	0.61	0.43
K_2O	2.76	0.30	0.35	0.22
Cs_2O	....	....	....	0.12
Na_2O	0.25	0.60	0.53	0.97
Li_2O	0.05	0.14	0.06	0.17
H_2O	1.76	2.06	1.49	1.49
P_2O_5	0.26	0.78	0.14	trace
	99.86	100.63	100.22	100.45

COPPER ANALYSIS.

Experiencing considerable trouble in analyzing, for the minor constituents, pig copper and copper alloys high in copper content, a method was sought by which the great mass of the predominant constituent would remain in solution and the elements present only in small quantities would be concentrated in a precipitate of comparatively small bulk and corresponding ease in handling, the use of separate portions of the same sample for the determinations being avoided as far as possible. The method given below is based on a number of experiments conducted with the view of ascertaining the solubilities of the salts involved, under the conditions in which they would occur in analysis of a pig copper and alloy and in analyses of copper containing known quantities of the elements usually found in commercial products.

Ammonia alone being uncertain both in completeness of precipitation and from the tendency of the precipitate to run through the filter, the following modification was adopted for systematic examination of such alloys and was found to remedy the drawbacks above mentioned:

Ten grams of copper were dissolved in nitric acid. Any great excess of acid removed by evaporation. Ammonia added to resolution of the copper salt. Barium hydroxide added in excess of the quantity sufficient to precipitate the minor constituents sought. Excess is quickly indicated by the separation of a scum of barium carbonate. Filtration was made in about half an hour. The precipitate separates out rapidly. Wash well with dilute ammonia to remove any adhering copper salt. With ten grams

of copper and a dilution of 150 cc. but little copper ammonium salts separate out. Fifty grams of copper and a dilution of 500 cc. gave on standing a considerable quantity of the salts. They are, however, readily soluble in dilute ammonia on warming, the precipitate not being appreciably so. On account of the dilution the method is only qualitative for arsenic and phosphorus. For lead, bismuth, tin, iron, manganese, and antimony it is complete. Silver, zinc, and cadmium were removed from the filtrate by decolorizing with solid potassium cryanide and precipitating by hydrogen sulphide. The barium salt gives no trouble. The sulphates of lead and barium can be weighed together. The lead sulphate separated by any of the known solvents, and determined directly or by weighing the residual barium sulphate. The treatment of the precipitate containing lead, bismuth, etc., is a matter of choice.

PATENTS OF INTEREST TO CHEMISTS.

EDITED BY ALBERT H. WELLES.

Ore Separators, etc.—511,512, December 26, Crosby, G. G., magnetic ore separator. 511,162, December 19, Roberts, F. C., puddling furnace. 510,251, December 5, Giroux, J. L., reverberatory, smelting, and refining furnace. 511,476, December 26, Vattier, C., roasting furnace. 511,090, December 19, Mathewson, E. P., furnace tap. 510,223, December 5, Wohlschlegel, C., pottery kiln. 509,890, December 5, Gonder, P., brick kiln. 510,448, December 12, Smith, M. V., coke oven. 510,051, December 5, Seymour, C. E., system of concentrating ores. 510,395, December 12, Ashcroft, E. A., apparatus for generating steam by aid of molten slag. 509,912, December 5, Jory, J. H., amalgamating sluice. 511,334, December 26, Hewett, G. C., manufacture of coke by heating coal at low temperature under pressure, consolidating into lumps, and coking in an ordinary furnace.

Iron and Steel.—511,648, December 26, Parkinson, W., converting cast-steel into wrought iron, by mixing charcoal and rolling mill scrap, reducing to spongy mass and mixing with particles of low steel and puddling. 509,973, December 5, Urick, W. P. B., method of casting solid ingots of steel. A rod is thrust into mold, then withdrawn and more molten metal is added to fill the mold. 510,340, December 5, Hines, J. H., coating iron with magnetic oxide, covering first with metal or alloy which will volatilize at a temperature below the fusing point of the iron, and then heating.

Lead.—510,979, December 19, Lunge, G., basic lead salts and caustic